

U.S. Patent Application Serial No. **10/519,673**
Amendment filed April 16, 2007
Reply to OA dated January 18, 2007

REMARKS

Applicants have corrected a typographical error in the specification and have amended claim 1 to clarify the present invention.

As now amended, Claim 1, the only independent claim, is to a fluid handling part for use in piping and fluid control devices that has a plurality of components, the plurality of components including a specified metal member having a contact surface to be brought into contact with one of the other components. The contact surface has an end exposed on an exterior of the fluid handling part and the specified metal of the fluid handling part is an alloy comprising, in % by weight, 0.001 to 0.01% of C, up to 5% of Si, up to 2% of Mn, up to 0.03% of P, up to 0.01% of S, up to 0.005% of O, 18 to 25 % of Cr, 15 to 25% of Ni, 4.5 to 7.0% of Mo, 0.5 to 3.0% of Cu, 0.1 to 0.3% of N, and the balance substantially Fe and other inevitable impurities. The alloy has a CRI (crevice corrosion resistance index) value in the range of $40 \leq \text{CRI} \leq 55$, as determined from the expression: $\text{CRI} = [\text{Cr}] = 4 \times [\text{M0}] + 30 \times [\text{N}]$, wherein the amounts of alloy components present in combination in the alloy to ensure crevice corrosion resistance are expressed in % by weight, and the specified metal member is up to 0.2 in surface roughness Ra.

In the office action, Claims 1-3 are rejected as obvious under 35 U.S.C. 103(a) in view of a combination of Knapp (U.S. 5,586,745) and Ueda et al. (U.S. 4,883,544); Claims 1, 2 and 4 rejected as obvious in view of a combination of Hoobyar et al. (U.S. 5,152,500) and Ueda, and Claims 1, 2 and 5 rejected as obvious in view of a combination of Meli (U.S. 6,039,361) and Ueda. The Knapp, Hoobyar and Meli references are cited to show the various fluid handling parts claimed, a valve,

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diaphragm valve or pipe coupling, while Ueda is cited to show a metal alloy that is known to have resistance to corrosion.

The Examiner's attention is drawn to three related pending applications and the prior art cited therein. These applications are U.S. Serial No. 10/519,672, U.S. Serial No. 10/519,674 and U.S. Serial No. 10/519,675. The prior art cited in these related cases is presented in an Information Disclosure Statement filed on even date with this amendment.

With respect to the Ueda reference, the Office Action states that the reference shows an alloy (See "A" of Table 1), in percent weight, 0.01% C, 0.55% Si, 0.58% Mn, 0.02% P, 20.12% Cr, 18.07% Ni, 6.12% Mo, 0.75%Cu, 0.215% N and the balance being Fe and other impurities, with small amounts of S and O, with the amounts of S and O being limited to as low a level as possible in order to provide hot-workability of the alloy (col. 7, line 65 - col. 8, line 11) with the alloy being used having a CRI value in the range of $40 \leq \text{CRI} \leq 55$ (the CRI value of "A" above is 51.05, with Cr being 20.12% by weight, Mo being 6.12% by weight and N being 0.215% by weight) and the alloy being used in order to provide an alloy having excellent workability and excellent corrosion resistance (col. 1, lines 8 - 15). The Office Action then alleges it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide various fluid handling parts of the alloy as taught by Ueda et al. in order to improve the workability and corrosion resistance of the part.

The present invention is not merely, however, one in which the fluid handling part is made of the specified alloy. The inventors took the crevice corrosion into consideration and made the

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present invention characterized in “the plurality of components including a specified metal member having a contact surface to be brought into contact with one of the other components, the contact surface having an end exposed on an exterior of the fluid handling part, the fluid handling part being characterized in that the specified metal member is made of an specified alloy”, which is not described or supported in any of the references cited.

Further, the specific alloy used in the present invention is one in which the crevice corrosion resistance is improved by considering the CRI value as shown in Fig. 1. There is no description at all in any of the cited references about considering the CRI value in this respect.

Furthermore, in the present invention claimed fluid handling part, the crevice corrosion resistance is improved by making the surface roughness Ra of the metal member a value of only up to 0.2, due to the synergistic effect generated by the above-mentioned surface roughness in combination with the above-mentioned alloy, which is not described in any of the cited references.

Claim 1, as now amended, specifies that the fluid handling part is of a specified alloy, as defined in the claim, with a specific range of CRI, and also that the specified metal member is up to 0.2 in surface roughness Ra (see at least page 5, line 6) which renders the singular portion less susceptible to crevice corrosion.

The secondary references do not add to the teachings anything that would render Applicants' claims obvious.

In view of the present amendments to the claims and the above remarks, Claim 1-5 are believed to be patentable and early allowance thereof is respectfully requested.


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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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